

CLAIMS

What is claimed is:

1. A microwave packaging material comprising:

a substrate;

a microwave interactive material layer supported upon the substrate,

wherein the microwave interactive material layer and the substrate together form a laminate material; and

an indentation pattern formed in the laminate material; wherein

the microwave packaging material supports a food product;

the food product overlies at least a portion of the indentation pattern; and

the portion of the indentation pattern directs moisture migration underneath the food product.

2. A microwave packaging material comprising:

a substrate;

a microwave interactive material layer supported upon the substrate,

wherein the microwave interactive material layer and the substrate together form a laminate material; and

an indentation pattern formed in the laminate material; wherein

the microwave packaging material supports a food product;

the microwave interactive layer generates heat upon impingement by microwave energy;

the indentation pattern creates a gap filled with air between the microwave packaging material and a cooking platform in a microwave oven when the microwave packaging material is placed in the microwave oven; and

the air in the gap provides insulation between the microwave packaging material and the cooking platform during operation of the microwave, reducing the effect of the cooking platform as a heat sink and improving the cooking ability of the microwave packaging material.

3. A microwave packaging material comprising:

a substrate;

a microwave interactive material layer supported upon the substrate,

wherein the microwave interactive material layer and the substrate together form a laminate material; and

an indentation pattern formed in the laminate material; wherein

the microwave packaging material supports a food product;

5 the indentation pattern creates a gap between the microwave packaging material and a cooking platform in a microwave oven when the microwave packaging material is placed in the microwave oven; and

when microwave energy generated by the microwave oven propagates through the gap, the incidence of microwave energy impinging upon the food product increases and
10 the heating ability of the microwave oven is improved.

4. The microwave packaging material as described in claim 1, wherein the microwave interactive layer comprises a susceptor film.

15 5. The microwave packaging material as described in claim 1, wherein the microwave interactive layer comprises a microwave reflective, shielding layer.

6. The microwave packaging material as described in claim 5, wherein the microwave reflective, shielding layer comprises an abuse-tolerant metallic pattern.

20 7. The microwave packaging material as described in claim 1, wherein the substrate comprises paper.

25 8. The microwave packaging material as described in claim 1, wherein the substrate comprises paperboard.

9. The microwave packaging material as described in claim 1, wherein the substrate comprises plastic.

30 10. The microwave packaging material as described in claim 1, wherein a first portion of the indentation pattern is wider than a second portion of the indentation pattern.

11. The microwave packaging material as described in claim 1, wherein a first portion of the indentation pattern is deeper than a second portion of the indentation pattern.

12. The microwave packaging material as described in claim 1, wherein
the substrate comprises a first side opposite a side adjacent to the microwave
interactive layer;

5 the microwave interactive layer comprises a second side opposite a side adjacent to
the substrate; and

the indentation pattern comprises a convex area on at least one of the first side of the
substrate and the second side of the microwave interactive layer.

10 13. The microwave packaging material as described in claim 12, wherein
the convex area provides a barrier that directs moisture migration from a first area
underneath the food product to a second area underneath the food product.

14. The microwave packaging material as described in claim 12, wherein
15 the convex area provides a barrier that directs moisture migration from a first area
underneath the food product to a second area not covered by the food product.

15. The microwave packaging material as described in claim 12, wherein
the convex area provides a barrier that prevents moisture from migrating from a first
20 area underneath the food product to a second area underneath the food product.

16. The microwave packaging material as described in claim 1, wherein
the substrate comprises a first side opposite a side adjacent to the microwave
interactive layer;

25 the microwave interactive layer comprises a second side opposite a side adjacent to
the substrate;

and the indentation pattern comprises a concave area on at least one of the first side of
the base substrate and the second side of the microwave interactive layer.

30 17. The microwave packaging material as described in claim 16, wherein
the concave area provides a channel that allows moisture to migrate from a first area
underneath the food product to a second area underneath the food product.

18. The microwave packaging material as described in claim 16, wherein the concave area provides a channel that allows moisture to migrate from a first area underneath the food product to a second area not covered by the food product.

5 19. The microwave packaging material as described in claim 16, wherein the concave area provides a channel that prevents moisture from migrating from a first area underneath the food product to a second area underneath the food product.

10 20. The microwave packaging material as described in claim 12, wherein the indentation pattern comprises the convex area on the first side of the substrate; the microwave interactive layer generates heat upon impingement by microwave energy;

15 the convex area creates a gap filled with air between the microwave packaging material and a cooking platform in a microwave oven when the microwave packaging material is placed in the microwave oven; and

the air in the gap provides insulation between the microwave packaging material and the cooking platform during operation of the microwave, reducing the effect of the cooking platform as a heat sink and improving the cooking ability of the microwave packaging material.

20 21. The microwave packaging material as described in claim 12, wherein the indentation pattern comprises the convex area on the first side of the substrate; the convex area creates a gap between the microwave packaging material and a cooking platform in a microwave oven when the microwave packaging material is placed in the microwave oven; and

when microwave energy generated by the microwave oven propagates through the gap, the incidence of microwave energy impinging upon the food product increases and the heating ability of the microwave oven is improved.

25 22. The microwave packaging material as described in claim 1, wherein the indentation pattern comprises at least one line.

23. The microwave packaging material as described in claim 1, wherein the indentation pattern comprises a plurality of lines.

24. The microwave packaging material as described in claim 23, wherein the plurality of lines comprises radii extending approximately from a center of the microwave packaging material to a peripheral margin of the packaging material.

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25. The microwave packaging material as described in claim 24, wherein the radii extend to a peripheral edge of the packaging material.

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26. The microwave packaging material as described in claim 24, wherein a first subset of the radii extends further into a peripheral margin than a second subset of the radii.

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27. The microwave packaging material as described in claim 24, wherein a first subset of the radii extends closer to the center of the microwave packaging material than a second subset of the radii.

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28. The microwave packaging material as described in claim 24, wherein the radii are formed in a zigzag pattern.

29. The microwave packaging material as described in claim 28, wherein the zigzag pattern comprises a first set of segments parallel to the radial direction and a second set of segments perpendicular to the radial direction.

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30. The microwave packaging material as described in claim 24, wherein the radii are formed in a sinusoidal pattern.

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31. The microwave packaging material as described in claim 23, wherein the plurality of lines extends from a first peripheral edge of the packaging material to a second peripheral edge of the packaging material.

32. The microwave packaging material as described in claim 23, wherein the plurality of lines comprises a first array of parallel lines.

33. The microwave packaging material as described in claim 32, wherein the plurality of lines further comprises a second array of parallel lines intersecting the first array of parallel lines.

5 34. The microwave packaging material as described in claim 33, wherein the second array of parallel lines is perpendicular to the first array of parallel lines.

35. The microwave packaging material as described in claim 1, wherein the indentation pattern comprises an array of individual, separated shapes.

10 36. The microwave packaging material as described in claim 35, wherein the array comprises a uniform distribution of the shapes.

15 37. The microwave packaging material as described in claim 23, wherein the plurality of lines comprises an array of concentric closed loops around a center of the microwave packaging material.

20 38. The microwave packaging material as described in claim 37, wherein the concentric closed loops comprise circles.

25 39. The microwave packaging material as described in claim 23, wherein the plurality of lines comprises an array of segments suggesting concentric loops around a center of the microwave packaging material, wherein the segments are perpendicular to radii extending from the center.

40. The microwave packaging material as described in claim 39, wherein the indentation pattern further comprises radii extending approximately from the center of the microwave packaging material, and wherein the segments intersect the radii.

30 41. The microwave packaging material as described in claim 23, wherein at least one of the plurality lines is formed as interrupted segments.

42. A method of manufacturing a microwave packaging material comprising:
providing a substrate;

adhering a microwave interactive material layer to the substrate to create a laminate material; and

forming an indentation pattern in the laminate material; wherein

the microwave packaging material supports a food product;

the food product overlies at least a portion of the indentation pattern; and

the portion of the indentation pattern directs moisture migration underneath the food product.

43. A method of manufacturing a microwave packaging material comprising:

providing a substrate;

adhering a microwave interactive material layer to the substrate to create a laminate material; and

forming an indentation pattern in the laminate material; wherein

the microwave packaging material supports a food product;

the microwave interactive layer generates heat upon impingement by microwave energy;

the indentation pattern creates a gap filled with air between the microwave packaging material and a cooking platform in a microwave oven when the microwave packaging material is placed in the microwave oven; and

the air in the gap provides insulation between the microwave packaging material and the cooking platform during operation of the microwave, reducing the effect of the cooking platform as a heat sink and improving the cooking ability of the microwave packaging material.

44. A method of manufacturing a microwave packaging material comprising:

providing a substrate;

adhering a microwave interactive material layer to the substrate to create a laminate material; and

forming an indentation pattern in the laminate material; wherein

the microwave packaging material supports a food product;

the indentation pattern creates a gap between the microwave packaging material and a cooking platform in a microwave oven when the microwave packaging material is placed in the microwave oven; and

when microwave energy generated by the microwave oven propagates through

the gap, the incidence of microwave energy impinging upon the food product increases and the heating ability of the microwave oven is improved.

5 45. The method as described in claim 42, wherein the step of forming further comprises scoring the laminate material to create the indentation pattern.

 46. The method as described in claim 42, further comprising cutting the microwave packaging material into a packaging shape.

10 47. The method as described in claim 46, wherein the step of forming occurs simultaneously with the step of cutting.

 48. The method as described in claim 46, wherein the step of cutting occurs before the step of forming.

15 49. The method as described in claim 42, wherein the step of forming further comprises molding the laminate material to create the indentation pattern.

20 50. The method as described in claim 49, wherein the step of molding further comprises compressing the laminate material to create sidewalls for a pan or tray.

 51. The method as described in claim 42, wherein the microwave interactive layer comprises a susceptor film.

25 52. The method as described in claim 42, wherein the microwave interactive layer comprises a microwave reflective, shielding layer.

 53. The method as described in claim 52, wherein the microwave reflective, shielding layer comprises an abuse-tolerant metallic pattern.

30 54. The method as described in claim 42, wherein the base substrate comprises paper.

55. The method as described in claim 42, wherein the base substrate comprises paperboard.

5 56. The method as described in claim 42, wherein the base substrate comprises plastic.

57. The method as described in claim 42, wherein a first portion of the indentation pattern is wider than a second portion of the indentation pattern.

10 58. The method as described in claim 42, wherein a first portion of the indentation pattern is deeper than a second portion of the indentation pattern.

15 59. The method as described in claim 42, wherein
the substrate comprises a first side opposite a side adjacent to the microwave interactive layer;
the microwave interactive layer comprises a second side opposite a side adjacent to the substrate; and
the indentation pattern comprises a convex area on at least one of the first side of the substrate and the second side of the microwave interactive layer.

20 60. The method as described in claim 59, wherein
the convex area provides a barrier that directs moisture migration from a first area underneath the food product to a second area underneath the food product.

25 61. The method as described in claim 59, wherein
the convex area provides a barrier that directs moisture migration from a first area underneath the food product to a second area not covered by the food product.

30 62. The method as described in claim 59, wherein
the convex area provides a barrier that prevents moisture from migrating from a first area underneath the food product to a second area underneath the food product.

63. The method as described in claim 42, wherein
the substrate comprises a first side opposite a side adjacent to the microwave

interactive layer;

the microwave interactive layer comprises a second side opposite a side adjacent to the substrate;

and the indentation pattern comprises a concave area on at least one of the first side of the base substrate and the second side of the microwave interactive layer.

64. The method as described in claim 63, wherein the concave area provides a channel that allows moisture to migrate from a first area underneath the food product to a second area underneath the food product.

65. The method as described in claim 63, wherein the concave area provides a channel that allows moisture to migrate from a first area underneath the food product to a second area not covered by the food product.

66. The method as described in claim 63, wherein the concave area provides a channel that prevents moisture from migrating from a first area underneath the food product to a second area underneath the food product.

67. The method as described in claim 59, wherein the indentation pattern comprises the convex area on the first side of the substrate; the microwave interactive layer generates heat upon impingement by microwave energy;

the convex area creates a gap filled with air between the microwave packaging material and a cooking platform in a microwave oven when the microwave packaging material is placed in the microwave oven; and

the air in the gap provides insulation between the microwave packaging material and the cooking platform during operation of the microwave, reducing the effect of the cooking platform as a heat sink and improving the cooking ability of the microwave packaging material.

68. The method as described in claim 59, wherein the indentation pattern comprises the convex area on the first side of the substrate; the convex area creates a gap between the microwave packaging material and a cooking platform in a microwave oven when the microwave packaging material is placed in

the microwave oven; and

when microwave energy generated by the microwave oven propagates through the gap, the incidence of microwave energy impinging upon the food product increases and the heating ability of the microwave oven is improved.

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69. The method as described in claim 42, wherein the indentation pattern comprises at least one line.

70. The method as described in claim 42, wherein the indentation pattern
10 comprises a plurality of lines.

71. The method as described in claim 70, wherein the plurality of lines comprises radii extending approximately from a center of the microwave packaging material to a peripheral margin of the packaging material.

72. The method as described in claim 71, wherein the radii extend to a peripheral edge of the packaging material.

73. The method as described in claim 71, wherein a first subset of the radii
20 extends further into a peripheral margin than a second subset of the radii.

74. The method as described in claim 71, wherein a first subset of the radii extends closer to the center of the microwave packaging material than a second subset of the radii.

75. The method as described in claim 71, wherein the radii are formed in a zigzag pattern.

76. The method as described in claim 75, wherein the zigzag pattern comprises a
30 first set of segments parallel to the radial direction and a second set of segments perpendicular to the radial direction.

77. The method as described in claim 71, wherein the radii are formed in a sinusoidal pattern.

78. The method as described in claim 70, wherein the plurality of lines extends from a first peripheral edge of the packaging material to a second peripheral edge of the packaging material.

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79. The method as described in claim 70, wherein the plurality of lines comprises a first array of parallel lines.

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80. The method as described in claim 79, wherein the plurality of lines further comprises a second array of parallel lines intersecting the first array of parallel lines.

81. The method as described in claim 80, wherein the second array of parallel lines is perpendicular to the first array of parallel lines.

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82. The method as described in claim 42, wherein the indentation pattern comprises an array of individual, separated shapes.

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83. The method as described in claim 82, wherein the array comprises a uniform distribution of the shapes.

84. The method as described in claim 70, wherein the plurality of lines comprises an array of concentric closed loops around a center of the microwave packaging material.

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85. The method as described in claim 84, wherein the concentric closed loops comprise circles.

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86. The method as described in claim 70, wherein the plurality of lines comprises an array of segments suggesting concentric loops around a center of the microwave packaging material, wherein the segments are perpendicular to radii extending from the center.

87. The method as described in claim 86, wherein the indentation pattern further comprises radii extending approximately from the center of the microwave packaging material, and wherein the segments intersect the radii.

88. The method as described in claim 70, wherein at least one of the plurality lines is formed as interrupted segments.

5 89. A microwave packaging material comprising:
a substrate; and
an indentation pattern formed in the substrate; wherein
the microwave packaging material supports a food product;
the food product overlies at least a portion of the indentation pattern; and
10 the portion of the indentation pattern directs moisture migration underneath
the food product.

15 90. A microwave packaging material comprising:
a substrate; and
an indentation pattern formed in the substrate; wherein
the microwave packaging material supports a food product;
the indentation pattern creates a gap filled with air between the microwave
packaging material and a cooking platform in a microwave oven when the microwave
packaging material is placed in the microwave oven; and
20 the air in the gap provides insulation between the microwave packaging
material and the cooking platform during operation of the microwave, reducing the effect of
the cooking platform as a heat sink and improving the cooking ability of the microwave
packaging material.

25 91. A microwave packaging material comprising:
a substrate; and
an indentation pattern formed in the substrate; wherein
the microwave packaging material supports a food product;
the indentation pattern creates a gap between the microwave packaging
30 material and a cooking platform in a microwave oven when the microwave packaging
material is placed in the microwave oven; and
when microwave energy generated by the microwave oven propagates through
the gap, the incidence of microwave energy impinging upon the food product increases and
the heating ability of the microwave oven is improved.